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Goal: To become acquainted with socket programming in python and begin to understand more how the TCP protocol is built.

Approach: In the first part python code was written for a client that would send a message to an echo client and calculate the round trip time based on the message echoed from the server. The socket library was used to open a socket to send and receive data. The date time library was used to get the time in microseconds since the time() function in the time library did not have enough resolution to to capture the elapsed round trip time. In the second part a solution to chapter 3 problem 6 was worked out.

Results:
The pinger program worked as expected timing out if a message was not received within a certain window of time the ouput of the program is as follows:

////////// Pinging Server //////////

Sending Message: Ping 1 680768
Server Response: PING 1 680768

Ping 1 RTT: 628 us

Sending Message: Ping 2 681428
Server Response: PING 2 681428

Ping 2 RTT: 200 us

Sending Message: Ping 3 681655
Server Response: PING 3 681655

Ping 3 RTT: 173 us

Sending Message: Ping 4 681853
Socket Timed Out In Sequence: 4

Sending Message: Ping 5 683082
Socket Timed Out In Sequence: 5

Sending Message: Ping 6 684350
Server Response: PING 6 684350

Ping 6 RTT: 279 us

Sending Message: Ping 7 684653
Server Response: PING 7 684653

Ping 7 RTT: 182 us

Sending Message: Ping 8 684852
Server Response: PING 8 684852

Ping 8 RTT: 148 us

Sending Message: Ping 9 685017
Server Response: PING 9 685017

Ping 9 RTT: 140 us

Sending Message: Ping 10 685173
Server Response: PING 10 685173

Ping 10 RTT: 137 us

Chapter 3 Problem 6

Because there is no timeout in the sender end if the sender sends a package and the receiver receives it but the acknowledgment it sends is lost the sender will be waiting for the receiver to acknowledge the package and receiver will be waiting for the next package.